

2011

NASA Ames Academy for Space Exploration



Academy Profile Book
Ames Research Center
Moffett Field, CA

NASA Ames Academy for Space Exploration 2011 Profiles

Table of Contents	3
Introduction	4
Contact Information	7

Research Associates

Emily Bathgate Australia	8
Johnathan Conley Arkansas	10
Eric Hinkson Arizona	12
Arlen Kam Hawaii	14
Sara Kokkila Minnesota	16
Kamau Mbalia Ohio	18
Jesica Navarrete Texas	19
Nathan Parrish California	21
William Rapin France	23
Jon Reijneveld Netherlands	25
Chantz Thomas Kansas	28
Ashley Williams Missouri	30
Michael Zero Illinois	32
Angela Zoumplis Virginia	34

Staff

Kevin Newman	36
Veronica Wu	39
Douglas O'Handley	41
Brad Bailey	43
Kristina Gibbs	44
Liza Coe	45
Matthew Reyes	47
Desireemoi Bridges	49

NASA Ames Academy for Space Exploration

Introduction

The NASA Ames Academy is a unique summer institute of higher learning whose goal is to help guide future leaders of the U.S. Space Program by giving them a glimpse of how the whole system works. The success of the Space Program results from the interaction of government, academia, and the private sector, each playing a critical and different role in the 50-year-old civil program. Responsibilities overlap, leaders migrate from one sector to another, and interdependence changes with each new administration.

NASA's Charter, written in the 1958 Space Act, gives NASA the main role of using and exploring space for the betterment of humankind. Congress and the President have both supported and restrained NASA as its programs have evolved. President John F. Kennedy's vision of putting a man on the Moon within the decade included much more than the Apollo spectacular of newspaper fame. After Apollo's success, NASA has constantly sought to redefine its goals and fine-tune its schedule every year seeking a budget to match its imagination. We have explored most of the planets, measured the solar system, flown humans in long-term endurance missions and short-term operational missions, invented new technology, and trained Congress, teachers, students, business people, and engineers, developing a whole new generation familiar with the expertise of the "Space Age."

The NASA Ames Research Center

The Ames Research Center (ARC), located at Moffett Field, California, in the heart of Silicon Valley, specializes in revealing new knowledge about the universe, planetary systems, and life science and in creating new technologies that enable exciting new ventures in aeronautics and space exploration. Throughout its history, results from research at Ames have significantly influenced national and international policy, enabled most of the major space missions of the past thirty years, and contributed science discoveries and engineering insights that have rewritten the textbooks. In the process of these endeavors, Ames has made numerous contributions to environmental protection, public health, and the nation's economic wellbeing.

The NASA Academy at Ames

Ames is unique in having world-class ground, airborne, and space flight research capabilities in aeronautics, astrophysics, earth sciences, astrobiology, fluid dynamics, gravitational biology, thermal protection technology, computational chemistry, planetary atmospheres, space laboratories, information sciences, and spacecraft life support.

As a result, Ames supports all aspects of the NASA vision to expand human presences to the Moon and eventually to Mars and acts as technical bridge to transfer skill, knowledge, and technologies among the NASA activities. This multidisciplinary synergy has created the world's only capability for the comprehensive study of Astrobiology -- life's origin, evolution, and distribution in the universe and destiny, from the protection of our planet to the evolution of terrestrial life into space.

Ames is the lead Center for understanding the effects of gravity on living things. Ames plays a major role in understanding the origin, evolution, and distribution of stars, planets, and life in the universe. One important activity is Ames' unique research in atmosphere and ecosystems science in support of Mission to Planet Earth and the protection of the global environment. In space technologies, Ames is also the lead Center in providing the thermal protection systems that are critical for future access to space and planetary atmospheric entry vehicles. Ames is NASA's Center of Excellence in Information Systems Technologies, encompassing research in supercomputing, networking, numerical computing software, artificial intelligence, and human factors to enable bold advances in aeronautics and space.

In aeronautics, Ames is the Agency's lead Center in airspace operations systems, including air traffic control and human factors, and the lead Center for rotorcraft technology. Ames also has major responsibilities in the creation of design and development process tools and in wind tunnel testing.

About 1600 civil servants and over 2000 contractor personnel are employed at Ames. In addition, Ames is proud to host more than 500 graduate students, cooperative education students, post-doctoral fellows, and university

faculty members who work in collaboration with Ames' preeminent scientists and technologists. Ames is a pioneer in the application of the multidisciplinary approach in science, technology, and projects, that is, combining the perspectives, training, and technologies of a variety of discipline experts to attack problems of exceptional difficulty. Multidisciplinary approaches are flexible and tend to stimulate cutting edge concepts. Successful application of this technique requires a deep appreciation for the talents, skills, and insights of others and ability to cross-organizational lines to reveal hidden treasures of understanding. Today, more and more scientists and high tech industries are using this approach with remarkable results.

It is in this spirit of shared discovery and the synthesis of diverse talents that Ames offers the NASA Academy at Ames. Students will contribute to every aspect of successful multidisciplinary research on Earth, in the air, and in space, from the formulation of an idea to the procurement of goods and services necessary to develop it, through the management, marketing, and manufacturing necessary to turn a concept into a reality.

Academy for Space Exploration

One goal of the Academy is to provide insight into all of the elements that make the NASA missions possible, while at the same time assigning the student to one of our best researchers to contribute towards one of our missions. Each student will be handpicked by a series of gates -- panels, interviews, etc., starting with their own State Space Grant Consortium who has selected and agreed to sponsor them. The researchers at Ames are selected to provide a diverse set of tasks that covers all aspects of on-going work at the Center. The "match" between student (Research Associate) and researcher (Principal Investigator) will be done by mutual selection.

Sixty percent of the time at Ames will be spent in the laboratory of the selected Principal Investigator assisting in research. About 40% of the working time and most of the social time of the students will be spent as a "group" or "team" in plenary sessions. This time will be devoted to exchange of ideas, on forays into the highest level of decision making, prioritizing, planning, and executing our space missions. This will be done by interviews with leaders and motivators of the space program. Besides the domestic Ames' experts, we will bring in leaders from the aerospace, high-tech, and genetic engineering firms in Silicon Valley; local, state, and national political decision makers; international partners; advocates and adversaries of space exploration.

Activities – June 13th – August 19th

These dates were selected to give most students a breather before returning to school. We know this is a compromise, as no two schools have identical schedules. **It is important that the students begin together and all end together.** The success of this Academy depends not on us as much as all of the students. **We do not accept people who are not able to attend this entire period. All students must be U.S. citizens or hold a "green card."**

Specific exemption may be made if a national space agency is involved.

Our intention is to assure that the students interact as a "team." We will always try to spark their leadership qualities. While we encourage the students to stay together as much as possible, we do not want them to feel trapped. All students will be housed in apartments just outside the main gates of NASA Ames' Research Park. Transportation will be provided each day.

We plan several trips on the weekends. These include trips to the other NASA Centers, such as the Jet Propulsion Laboratories, Dryden Flight Research Center, and Kennedy Space Center in Florida. Shorter trips to Lawrence Livermore Laboratories, Monterey Bay Aquarium Research Institute, the Desert Research Institute and other areas of interest in the West will be made. The selected students will plan additional weekend trips when they arrive. Each of the ten weeks will be a unique group experience, but at the same time the student will be working on a research project with Investigators in the Ames' laboratories or on our flight projects.

The Academy Experience

These past 12 summers, 11 - 15 students, interested in life, space, or Earth sciences, space technology, or space engineering came from all over the U.S., were selected for the 10 week session to share a unique experience resulting from their own ingenuity and free spirit. Teaching and learning are not the same. Teaching is the orthodoxy of our universities and colleges; learning is the "ah-ha!" process of finding out and understanding. That is our objective: to foster curiosity, to spirit endeavor, and to inspire leadership.

All of these elements make the Ames Academy a unique experience that will last a lifetime. Students not only participate in the Academy, but are inducted into the larger Academy Family through the NASA Academy Alumni Association (NAAA). It's been said many times by Academy students in the past, and we're sure it'll be true again this summer: "This has been the best summer of my life!!"

Student Support

The NASA Academy program is co-sponsored by the participating NASA Center and the National Space Grant College and Fellowship Program. Most State Space Grant Consortium offices, as well as the Space Grant offices of the District of Columbia and Puerto Rico, support the program. Please check with the Space Grant office in your State for participation information. Space Grant Consortia offices agree to provide the students with summer stipend support and round-trip transportation to and from the participating NASA Center. The participating NASA Center agrees to host the student, providing housing, local transportation, and meals. More information on the National Space Grant College and Fellowship Program is found at: <http://www.hq.nasa.gov/spacegrant/>

Student Eligibility

- Demonstrated interest in the Space Program,
- Enrolled as a junior, senior, or graduate student (as of June 1 of the program year)
- Maintain an overall B plus average (minimum)
- Majoring in science (physics, chemistry, biology, etc.), math, engineering, computer science, or other areas of
- interest to the space program
- Be a US citizen or permanent resident (as of June 1 of the program year)

Contact Information

NASA Academy information is obtained through these sources:

<http://www.nasa-academy.nasa.gov/>
<http://academy.arc.nasa.gov>

Telephone & email

Tel: (650) 604-2104

EMAIL: brad.bailey@nasa.gov

US mail

Brad Bailey
NASA Ames Research Center
M/S 17-1
Moffett Field, CA 94035

2011 RESEARCH ASSOCIATE PROFILES



UNIVERSITY OF TECHNOLOGY
SYDNEY, AUSTRALIA

Education and Experience:

I was born in Sydney, Australia, and grew up immersed in its beach culture, which led to my love of sailing and exposed me to the value of teamwork. After a long day sailing I would often lie on the deck

and watch the stars, dreaming of what may be found in the far reaches of space. Thus, my love for the ocean led me to grow up with a love and appreciation of the universe.

In High School I had many aspirations for possible careers. I was undecided whether to become a pilot, a photographer, or a scientist. Finally the deep ocean and the vastness of space captured my imagination: I dreamed of being an active participant in humanity's exploration of the far reaches of space.

I undertook a Bachelor of Science in Marine Biology at the University of Technology, Sydney. Here I was inspired during a class in Astrobiology to pursue an Honours degree in this discipline. For my Honours project I was involved in research that investigated the possible extent of ice-sheets and paleo-oceans on Mars, thus combining my life-long passions for the vast expanses of the ocean and space. My background in biology gave me a unique perspective on the geological features I observed. Furthermore I gained hands-on experience in the processing and interpretation of NASA and ESA orbital images of Mars. Completing my Honours program with such an exciting project was a thrilling adventure, which has motivated me further to pursue space science studies.

The opportunity to attend the NASA Ames Academy is a dream come true for me and I yearn for the opportunity to contribute to the progression of humanity in its quest to reach Mars and beyond.

With the completion of the Academy program I will gain international exposure and I hope to build long-lasting collaborations. I want to ensure that my Academy experience will inspire young Australians to aim high and pursue their interests and dreams, by providing an example of what can be achieved

MARINE BIOLOGY/GEOLOGY FOR
HONOURS

PI: DR. CAROL STOKER

PROJECT: MINERALOGICAL
ANALYSES OF MARS ANALOGUE
SOILS SAMPLED AT MDRS IN UTAH

EMAIL ADDRESS:
EMILY_BATHGATE@HOTMAIL.COM

if one follows the path of one's curiosity and wonder.

Extra Curricular

I am a very keen Sailor and have been sailing from a young age on my family's 27ft yacht: 'Yellow Bird'. The peace I feel on the water when we take the yacht for coastal sails and join in 'Endeavour' class regattas is immense. I love singing and photography, two activities that fill my time when I am not studying or looking at the stars: I never leave the house without bringing along at least one camera.



UNIVERSITY OF ARKANSAS
FAYETTEVILLE, AR

Education and Experience:

The NASA Ames Academy for Space Exploration is not simply a research internship; it is an opportunity to take part in an American tradition that has had an immeasurable impact on the development of our country since its inception. The sense of

pride that united a nation when Neil Armstrong first walked on the moon and the sense of awe felt when staring into the very depths of the universe through the Hubble Space Telescope were realized directly through NASA projects. As the frontiers of our civilization begin to expand beyond earth, people at NASA will be writing the history of tomorrow. Through the NASA Academy, I can help to pen some of the chapters.

Space is my passion like no other subject. One of my absolute earliest memories is that of a little toy space shuttle that I played with for hours as a child. I flew the little white plastic shuttle from my bedroom to Jupiter in my imagination. I still remember making it orbit the tabletop globe that we had at home, turning off the lights in the room when it was on the dark side of the planet. As I grew older, I abandoned toys in favor of heavy textbooks and late nights doing homework. As I have progressed in my education, space has gotten a lot closer than just my imagination.

I have worked very hard to prepare myself academically for a career in the aerospace industry. My undergraduate degrees in mechanical engineering and physics will give me the technical acumen to succeed in a demanding scientific field. I have complemented this conceptual knowledge with experiential knowledge by participating in design and research projects. As a member of our NASA Lunabotics team, I helped to design and build the drive systems that powered our robot to collect simulated lunar regolith. On our AIAA Design Build Fly team, I helped to select proper NACA airfoils and conduct materials qualification testing. My honors undergraduate research project on spectral characterization of Venusian mineralogy allowed me to learn more about planetary science while developing a desire to actually use the scientific equipment and vehicles I was learning to design. An

MECHANICAL ENGINEERING / PHYSICS

PI: PETE WORDEN AND JOHN KARCAZ

PROJECT: LOW-COST MANNED MARS
MISSION ARCHITECTURE

EMAIL:
CONLEY.JOHNATHAN@GMAIL.COM

internship at SpaceX this spring has solidified my understanding of engineering theory and application while giving me the inspiration and ability to push humankind forward to explore the boundaries of our knowledge and civilization. By learning how to apply knowledge learned in the classroom to build space hardware, I have better prepared myself to use space hardware to generate new knowledge.

Interest and Extracurricular Activities:

I love to explore. Whether that exploration is in learning a new skill like metalworking or going on a trek to find a geocache, I relish the thrill of intellectual and physical pursuit and discovery. I am constantly on a quest to acquire as many skills, certifications, and memberships as possible. I am a competition rifle marksman. I hold a General-class amateur radio certification, and I am in the middle of earning my Private Pilot License. From wilderness first aid to storm-spotting, I take every weekend class I can find. I plan to apply my diverse set of skills to become an astronaut and actually touch the heavens I have gazed upon for so long from the ground, but even if I do not succeed in that goal, along the way I will have explored the most interesting planet human beings have discovered—Earth!

Future Plans:

I plan to attend graduate school in aerospace engineering this fall at either Virginia Tech or the University of Maryland. A doctorate will better my knowledge while generating meaningful research results through a thesis project. The importance of linking pure research to visible application makes industry cooperation extremely important. While pursuing graduate studies, I plan to participate in co-ops or internships at more NASA centers or private aerospace companies like Bigelow, Orbital, or Boeing. These organizations are full of dreamers that have a vision for what the world of tomorrow should look like. Most importantly, though, they have highly talented individuals that can make those dreams a reality. After graduate study, I plan to work at NASA or one of the aforementioned companies in a research and development position. Research and development will allow me to pursue my passion for pure science while applying my best skills as an engineer. Later in life, I am interested in a university teaching or research position. Throughout my career, my true goal is to continue the tradition of discovery pursued by the thinkers, scientists, and engineers who came before me. The next generation of explorers are those who have trudged through the regolith of the moon, made a home in the vacuum of space, and will plant the first footprints in the red dust of Mars. I will bring this spirit of exploration into reality. Through my work in the aerospace industry, I will ensure that the future is as bright as I imagined it would be when I was just a child with a toy spaceship. As American computer scientist Alay Kay says, “The best way to predict the future is to invent it.” Through my time at the Academy, I will be doing just that.



ARIZONA STATE UNIVERSITY POLYTECHNIC
MESA, AZ

Education and Experience:

From a very early age, I knew that I was destined to live a life in pursuit of the sciences. My favorite toys growing up were Legos, K'nex, and of course the "classic" Erector sets. Basically, I was into anything that involved building something with my hands to achieve some purpose. When my family purchased

our first computer I was very young, and I was absolutely intrigued. Immediately, I had deconstructed the giant computer tower, examining every component to determine its purpose. Of course my parents were mortified that I had taken apart such an expensive piece of equipment, but I was able to put everything back together, bringing the machine back to 100% functionality. It was from that moment that I was sure I needed to pursue an educational path that involved computers and electronics in one way or another.

In high school I took many courses on web design and computer aided drafting applications such as Autodesk's AutoCAD. My freshman year I helped to design, build and eventually pilot a solar powered boat in Tempe Town Lake for SRP's (Salt River Project) solar powered boat races.

One driving characteristic of my personality is that I have a passion for being a part of something larger than myself. Hence, I am involved in multiple organizations such as my Fraternity, the Salvation Army, and other various clubs around campus and town. It was this same desire to contribute to something larger than myself that made me choose a path to focus my education and life's goals on improving the planet we live on by studying and bettering today's alternative energy technologies. My program's focus is on the solar-hydrogen cycle, whereby energy is derived from the sun using photovoltaic modules and may be stored for later use as hydrogen in polymer electrolyte membrane fuel cells. Thanks to the ASU/NASA Space Grant, I have been privileged to be able to work on research to improve performance and durability of these fuel cells while reducing their overall cost for the past year. As a part of this program I had the opportunity to work on two projects for the U.S. Army that allowed me to perform research in ASU's Center for

ELECTRONICS ENGINEERING /
ALTERNATIVE ENERGY

PI: DR. ROBERT S. MCCANN

PROJECT: HABITAT DEMONSTRATION
UNIT PRESSURIZED EXCURSION
MODULE

EMAIL ADDRESS: EHINKSON@ASU.EDU

Solid State Electronics Research (CSSER), a class-100 clean room.

It is this same desire to contribute to a much larger picture than myself that brings me to seek education and opportunity from the NASA Academy at Ames. If I can be part of engineering project teams that allow for the exploration of space for the betterment of humanity, my lifelong desires will be greatly satisfied.

Moving Forward

This year I received an award from the Department of Defense, known as the SMART Scholarship award, which begins in the Fall 2011 semester. As a part of this program I will have the opportunity to work with the U.S. Army as a civilian engineer in the Information Systems Engineering Command (ISEC) at Ft. Huachuca in Sierra Vista, Arizona.

I am extremely excited about this summer's research opportunity at the NASA Academy at Ames. It has always been my desire to be on the cutting edge of technology and innovation, and no organization can provide me that opportunity better than NASA. I know that the knowledge learned there and the people that I meet will change my life forever, in a very positive manner. Once I have been exposed to life as an engineer with NASA, I don't expect that I will be able to be satisfied with any other career path.



STANFORD UNIVERSITY
STANFORD, CA

Education and Experience:

My interest in space started in 7th grade when my science teacher showed us a poster that depicted space in a series of expanded images. A point on the picture of the universe expanded to show the Milky Way galaxy, a point in our galaxy expanded to show our solar

system, and a point in the solar system expanded to show the Earth. That poster showed me that I couldn't possibly begin to grasp how enormously big space really is, and I got so excited that there was just so much more to know.

Going into undergraduate school, I knew I wanted to go into engineering, and my interest in space exploration made Aerospace Engineering a perfect fit for me. In my 4th and 5th years at UCLA I took a couple astronautics courses that I really enjoyed. Space travel presents a challenge in that it can only be achieved by understanding and utilizing many different disciplines such as propulsion, orbital mechanics, and control systems, to name a few. On top of that, space is such an exciting engineering field right now since it is very new; we have only been going into space for 50 years! Throughout my studies, I always felt that there was more to learn, which was the main reason I decided to attend graduate school.

I am currently in my second year as a Master's student in the Aeronautics and Astronautics department at Stanford University. I am involved in the Space Environments and Satellite Systems laboratory, which is a great way for me to learn about ongoing research in space travel and space environments. During my first quarter at Stanford my advisor, Dr. Brian Cantwell, told me I should consider applying for the NASA Academy and after reading and hearing more about the program I absolutely wanted to participate.

I applied to the Academy because I want to be at the cutting edge of space exploration, and there is no better place to do that than at NASA. I was also attracted to the program because while my main interest is orbital mechanics, I really liked the idea behind the group project: that I will be learning about possibly several disciplines very different from my studies. The NASA Academy presents an enormous opportunity, and I am so excited to

AERO/ASTRONAUTICS

PI: DR. BUTLER HINE

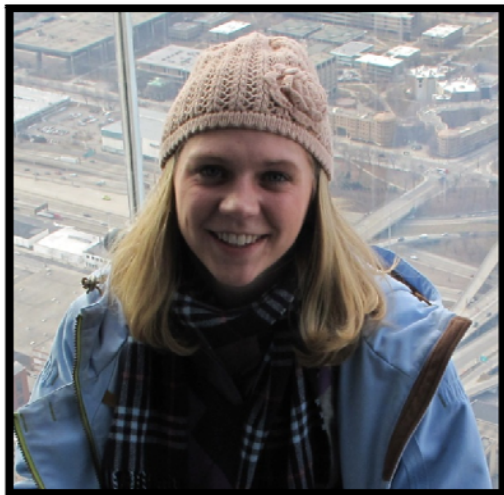
PROJECT: LADEE

EMAIL: ARLEN@STANFORD.EDU

be a part of it.

After I finish my Master's in March 2012, I want to work for NASA to continue to contribute to the development and planning of the technologies and space missions that will make the biggest impacts on our world. I have recently become very interested in the Mission Systems Concepts group at NASA Jet Propulsion Laboratory.

As for my personal life, I was born and raised in Honolulu, Hawai'i, where almost all of my family still lives. I have one younger brother, who is a Lance Corporal in the U.S. Marine Corps, and is currently on his first tour in Afghanistan. I am an avid hula dancer, and have been dancing since I was 7-years-old. I enjoy camping, backpacking, SCUBA diving, skiing, and most outdoor activities.



COLLEGE OF SAINT BENEDICT
SAINT JOSEPH, MN

Education and Experience:

When I was eight years old, my family visited the Kennedy Space Center. To my surprise, the tour began with a greeting from Lucy, a robot. This seemed to be straight out of a book or a world of

imagination. From this point on, I secretly dreamed of working for NASA.

As I continued with school, my interest in science grew. Currently, I am a chemistry and mathematics double major at the College of Saint Benedict in cooperation with Saint John's University. I started on a track for pre-medicine, but I had not forgotten my dream to work for NASA. I stumbled across the application for NASA's Undergraduate Student Research Program and I realized that if I never tried, I would never know if this dream could become reality. I applied and was accepted into the USRP program at NASA Ames.

My research in the Undergraduate Student Research Program involved using theoretical chemistry techniques to gain better understanding of certain types of compounds that are released into the atmosphere. We ran calculations for over three hundred different compounds that are known greenhouse gases. From this information, we created models that can be used by the industry to design less detrimental compounds based on the placement and number of certain kinds of atoms. The work I did last summer changed my life and my direction in it. From that point on, I decided to no longer pursue medical school, but to instead apply to graduate schools in order to continue doing research.

In addition to my USRP research, I just completed an honors thesis in both math and chemistry, researching the area of enzyme kinetics. I studied how the amount of product from an enzyme system changes over time and then developed mathematical models for different types of enzyme inhibition. These different models can be fit to data sets monitoring the change in amount of product or reactant over time. From this, certain constants that are otherwise difficult to determine can be found easily determined from the fitted models.

CHEMISTRY AND MATHEMATICS

PI: DR. TIMOTHY J. LEE

PROJECT: THEORETICAL CHEMISTRY
APPROACH TO DETERMINE
PROPERTIES OF THE AZIRINYL CATION
AND ITS SIGNIFICANT ISOMERS

EMAIL: SARAKOKKILA@GMAIL.COM

Besides my interests in chemistry and mathematics, I am involved with several groups on campus. Throughout my college career, I have been heavily involved in the theater department. My junior year, the theater department made me an honorary theater major because of my extensive involvement in theater productions in areas such as dancing, acting, and costuming. I was also an officer for the campus Drama Club for several years and only recently gave up my presidency to a rising senior. I am also an active member of the campus Phi Beta Kappa Honor Society, Delta Epsilon Sigma Honor Society, Math Society, and Chemistry Club. I am interested in traveling and was able to study abroad in Greece and Italy spending half the semester in Athens and the other half in Rome.

I will be graduating this May with a B.A. in chemistry and mathematics, as well as receiving honors in both fields of study. Next fall, I begin my graduate studies at Stanford University to ultimately receive a Ph.D. in chemistry. I am excited to further develop leadership and researching skills at the NASA Academy and to explore the possibilities with fellow Academy members and leaders. I believe that this experience will help me with my future goal of a research career at NASA.



CENTRAL STATE UNIVERSITY
WILBERFORCE, OHIO

Education and Experience:

Born and raised in Milwaukee, WI, I now attend Central State University located in Wilberforce, OH. While attending Central State, I am majoring in Environmental Engineering with a minor in Mathematics.

During my time at Central, I have had numerous opportunities to branch out and receive real world experience. As a freshman, I interned with the National Renewable Energy Laboratory (NREL) in Golden, CO. While at NREL, I dealt with Solar cells and photovoltaics' conducting tests on the impurities and lifespan of Silicon wafers. During my sophomore year, I interned with the National Oceanic and Atmospheric Administration (NOAA) monitoring and conducting tests on environmental satellites surveying such things as tropical storms, hazardous debris, and wild fire. Finally, the summer of my junior year I again interned with NOAA where I conducted tests on water quality. These tests included Total as well as Volatile suspended solids, and analysis on algae. Also, I am fortunate enough to take part in several extra-curricular activities.

I currently hold the position of Vice President of the Environmental Engineering club located here on campus as well as being an associate member of the Dayton Environmental Advisory Board. Upon completion of my undergraduate degree in 2011, I plan on continuing on to graduate school where I plan to obtain a Doctorate as well as Professional Engineering standing.

ENVIRONMENTAL ENGINEERING

PI: DR. FRIEDEMANN FREUND

PROJECT: EARTHQUAKE
FORECASTING USING THE OXIDATION
OF AROMATIC PARTICLES

EMAIL: KMBALIA@YAHOO.COM



Education and Experience:

The passion I have for scientific research is something that was encouraged by my family from a very young age. My grandfather and role model, was not a classically trained geologist, but worked in mining for many years. Because of his curiosity about the minerals and ores he helped discover, he taught himself about natural sciences, including geology and the environment. This spirit of learning is the legacy that he has left for all of his descendants, and I hope to continue on this pathway in my pursuit of a doctoral degree and in my future work as a mentor and researcher.

I am in my second semester of graduate school at the University of Texas at El Paso in the Geological Sciences doctoral program. My first graduate research experience was working with partners in biology and chemistry on a Boeing/NASA cooperative to evaluate and characterize the degradation pathways of an antimicrobial compound used on the International Space Station to control microbes in the internal thermal coolant system. This is the same coolant fluid that is hooked into astronaut space suits during space walks.

This work transitioned into an NSF-funded interdisciplinary project that combines the fields of microbiology, geochemistry, and isotope chemistry. We can use the information revealed by the stable isotope ratios of transition metals (like Cu or Fe) to interpret the ancient rock record on Earth or perhaps

GEOMICROBIOLOGY

PI: LYNN ROTHSCILD

PROJECT: SYNTHETIC BIOLOGY

EMAIL:
JNAVARRETE2@MINERS.UTEP.EDU

even say something about rocks on other planets. For the past two summers I have worked with my research team to sample the highly contaminated waters of a heavily mined region in central Colorado. Using geochemical and hydrological tools, our work has helped identify the sources and pathways of heavy metal contaminants as well as potential sinks for these contaminants. My interest is in identifying and studying microorganisms in these extreme systems to determine if they can be indicators of toxicity as well as passive agents for remediation as they readily thrive in these harsh and extreme

environments.

My professional and life goals are to contribute to the NASA vision as we work to improve life here, extend life to there, and find life beyond...

CALIFORNIA POLYTECHNIC STATE
UNIVERSITY
SAN LUIS OBISPO, CALIFORNIA



Nathan Parrish

Education and Experience:

Although many would call growing up in the middle of nowhere “boring”, it has one premium feature which is becoming increasingly difficult to find: a clear view of the heavens. From a very young age, I was taught the wonders of the sky and came to hold the same respect for the vast space above us as I did for closer things like rocks and trees. Although I never would have guessed how far it would take me, space is a road I have always been on and hope never to leave.

All through high school, I was heavily involved with my school’s FIRST Robotics team. My first two years of college, I was able to give some back to the program as a mentor. Now, I am a rising senior at Cal Poly, studying Aerospace Engineering. I have been increasingly involved with Cal Poly’s AIAA chapter and love having fun with space, flight, and spaceflight.

Interests:

One of my favorite hobbies is photography. I started shooting in middle school with an old (even then) point-and-shoot digital camera. For my 16th birthday, I upgraded to a Nikon D50, which is still great today, almost five years later!

Other pastimes include biking (as in bicycles, not motorcycles), computer-ing (building, fixing, or using), and reading (I’m working through the *Sword of Truth* series right now).

AEROSPACE ENGINEERING

PI: MATTHEW D’ORTENZIO

PROJECT: DETECTION OF CAVES
AND SUBSURFACE GEOLOGY ON
MARS

EMAIL: NPARRISH@CALPOLY.EDU

Future Plans:

I have long anticipated an opportunity to work for NASA in some way, and I am excited to finally have that chance! I am hopeful that the Academy will be a guide for my first steps with NASA and that it will be the jumping off point for a long career of space, science, and engineering. My goal is to travel to space. If that proves impossible, my next goal is to see the

world in its entirety. Working with a talented international crew on various aspects of space exploration this summer seems like a great way to work towards both goals simultaneously. With any luck and a lot of work, the Academy will let me form strong bonds with the individuals and institutions whose aim it is to stretch humanity's dreams and reality to the stars and beyond.



Education and experience

I was born and grew up in Lyon, France. Very early I felt a passion for space and astronomy as a consequence to my general curiosity for nature. I developed this interest through photography and drawings : I used to represent what comes out of my imagination. It has proven to be very beneficial in the way that it put me to the test, reflecting my personality and state of mind.

After high school, I first thought of a career in Arts or Architecture. Later, although admitted in a French art school, my willingness to understand and investigate nature and people, combined with very distinctive academic results in Math, Physics and Engineering Science in a college in Lyon, led me to ISAE-SUPAERO in Toulouse, France.

There I had the opportunity to participate in several student projects and initiate some of them. For instance, with a team of three other enthusiastic students, I organized many events related to space such as lectures, French space industry facility visits and even invited several French astronauts for a lecture and private dinner with them. In parallel to university courses I wanted to have a hands-on experience which I found by joining the ESEO and ESMO

missions where our team is involved to design, built and integrate the star trackers. I participated to a workshop in London for this project which helped me discover the challenges regarding European space collaborations.

ASTROPHYSICS & AEROSPACE
ENGINEERING

PI: DR. WILLIAM J. BORUCKI

PROJECT: CHARACTERIZATION OF
KEPLER'S PLANETARY
CANDIDATES WITHIN THE
HABITABLE ZONE

KEPLER SPACE TELESCOPE

EMAIL: WILLIAMRAPIN@GMAIL.COM

I have chosen astrophysics as a major as I was already convinced to dedicate my professional life to space exploration and the understanding of the universe. I have been mainly influenced by Kim Stanley Robinson in his science fiction writings about Mars and by Isaac Asimov amazing novels. I have been impassioned by Mars since I saw it for the first time through the optics of a telescope. With several other students I organize trips for night sky observation. These events attract more and more people and enable us to share and

discuss with them around astrophysics and space exploration topics freely.

Just next to my obsession for the immensity and unexpected diversity of space science, I love drama and improvisation practice because it involves a lot of creativity and team work. I also draw a lot of illustrations in my spare time which, without mentioning my random drawings, has often been a kind help for designing posters. I enjoy travelling and I'm always attracted by far destinations. I went for two months to Japan last year, and thanks to the NASA Academy, I will go for the first time to the USA.

Being selected as a French student for the NASA Academy appears for me as the greatest milestone of my education, experience and more. All the feedback I had from the few French students who completed the program has always met my expectations and wishes.

Future plans

Right after the summer program, the agreement between NASA and CNES (French space agency which is part of the selection procedure and gives me the founding for the internships) includes an internship at NASA Ames for 4 months and a 6 months internship in France. I expect to get Aerospace Engineering diploma from ISAE-SUPAERO in 2013 with a research M. Sc. in Astrophysics. Then I am considering doing a PhD in Astrophysics or more precisely in Planetology or Astrobiology.



About me

‘A strong desire to understand everything around me’, that’s who I am. Since I was young my two passions have always been biology and technology. As a kid I loved to spend time outside and I was virtually able to name every plant and animal I came across. My other favorite pastime was the disassembly of every device I could get my hands on: ‘to figure out how they worked’. This was quite a burden for my parents, especially when after reassembly I discovered I didn’t need all parts anymore, oops!

Interest in space

My interest in space started when I was around the age of 10: from this period I have a clear memory of me and my dad sitting on our roof watching comet Hale-Bopp leaving its perihelion. The first images taken by the Mars rover Sojourner were also released in that year, which I read about in the news paper with much fascination: my passion for spaceflight was born!

After a national competition in 2002 I was selected by ESA to participate, as the Dutch representative, in NASA’s Advance Space Academy. At the Space and Rocket Center in Huntsville, Alabama I experienced what it was like to be an astronaut. After this experience I was sure I wanted a career in space!

AEROSPACE ENGINEERING/SPACE
SYSTEMS ENGINEERING

PI: DR. PETER JENNISKENS

PROJECT: DEVELOPING OF A
PROPOSAL FOR ‘THE 2011 DRACONIDS
MULTI-INSTRUMENT AIRCRAFT
CAMPAIGN’

EMAIL:
JONREIJNEVELD@GMAIL.COM

In 2004 I had the opportunity to go abroad for my other passion, biology. After participating in the National Biology Olympiad I was selected to take part in the International Biology Olympiad in Brisbane, Australia. During this event I learned about the development of early life on our planet and this got me interested in the area where space and biology overlaps: astrobiology.

University

In September 2004 I chose to continue my studies in the field of Aerospace Engineering at the Delft University of

Technology in the Netherlands. My Bachelor was concluded with a thesis project on a mission to investigate the presence of a subsurface ocean on Jupiter's moon Europa.

During the last year of my Bachelor I was also active in the Space Department of the study association, where I organized space related lectures and excursions. The highlight of that year was a lecture of the second man on the moon, Buzz Aldrin. This experience was just exhilarating and strengthened my space fanaticism.

After finishing my Bachelor cum laude in 2007 I was asked to join the board of the study association. Together with 6 other students I spend a year working full time in service of the Aerospace Engineering students. We organized a wide variety of activities including a study tour to the USA and Brazil and a technological career fair with over 100 companies and 1300 students. In this year I learned how to work in groups, communicate efficiently and what it is like to be part of a professional organization.

In 2008 I started with my Master Space Systems Engineering at the Delft University of Technology. During my Master I completed my Honours Track at the ETH Zurich, Switzerland, where I worked on a research project on Exoplanet detection probability. Currently I am working on my thesis for which I am developing the Attitude Determination and Control System for the 2nd University satellite named Delfi-n3Xt; my graduation is expected early 2012.

Work Experience

In 2010 I worked as an intern at EADS Astrium in Germany on the SWARM satellite project, which will investigate the Earth magnetic field. In an international setting, I was responsible for the design of Matlab simulation software and I assisted in the magnetic measurements of flight equipment in the clean room.

Beside my master I currently have a student job as Program Officer of the international postgraduate Master program SpaceTech, where I am responsible for the organization of all logistics. This job has given me a unique insight into the worldwide space sector and I experienced what it is like to work in an international and intercultural environment.

Academy expectations

With the experiences at the Academy I expect to develop myself as a successful space engineer, continue to develop my ability to work in international teams and enhance my leadership skills. Next to that, this program will give me a good insight in the US space industry, giving me stronger skills and understanding for future contributions within the European space environment. It is likely that many critical space endeavors in the future will be in joint efforts between Europe and the United States, and we will need engineers and leaders in the space industry that have insight about how NASA

and US industry works. Altogether participating in NASA Ames Academy should be a very rewarding experience!

Future goals

Ten to fifteen years from now I aspire to act as catalyst for collaboration between NASA and ESA and to be a game changer in the way of doing business. New huge projects need to be started, which will fascinate the general public for years to come. These large and intriguing projects will be very complex and so expensive that they can only succeed when we work together on a global scale. The opportunity to contribute to such projects would be extremely fulfilling and we will be the ones that give structure to these projects, so let's go and realize them!



UNIVERSITY OF WASHINGTON
SEATTLE, WA

Education and experience:

I was only a few years old when I told my parents that I wanted to become a “NASA scientist.” The years that followed brought pursuits in medicine and molecular biology into focus, but space exploration and research was never far from my mind. I was walking to an Organic Chemistry lab several years ago when I made a fateful decision to detour to a temporary NASA exhibit on the Constellation Program. When I walked out of the exhibit, I resolved that I had to try to contribute to the space program – humanity’s most daring endeavor. Since that day, I have relentlessly sought the opportunity to participate in research at NASA.

I have spent the past four years at the University of Kansas. In May 2011, I received a Bachelor of Science in Microbiology with Honors and a Bachelor of Arts in History with Honors. My scientific research has been in immunology with projects focusing on immune cell differentiation and migration control. At KU, I have also worked on a project that tested the efficacy of an enhanced immunosuppression strategy in a new model organism. In the summer of 2010, my immunology research took me to the Dana-Farber Cancer Institute and Harvard Medical School for additional training and research on the structural biology of the T cell receptor (D.K. Sethi *et al.*, 2011). My honors thesis in history, titled “‘In Hours Only’: The Controversial Birth of Heart Transplantation,” focused on redefining the role of an early, but forgotten pioneer of heart transplantation in the scientific and ethical development of his field.

At KU, I participated in the Student Senate, the Journal of Undergraduate Research, and the Student Health Advisory Board. I also founded an undergraduate microbiology society and played a role in a variety of other campus activities. Outside of science, I enjoy cooking, photography, music, writing, and the occasional chance to go sailing.

I have recently joined the University of Washington’s Medical Scientist Training Program. There, I will complete an MD and a

MICROBIOLOGY, IMMUNOLOGY,
HISTORY OF SCIENCE

PI: RICHARD BOYLE, ARC & MILLIE
HUGHES-FULFORD, UCSF

PROJECT: EFFECTS OF SPACEFLIGHT
ON MURINE THYMUS STRUCTURE
AND FUNCTION

EMAIL: CHANTZT@KU.EDU

PhD in immunology. I plan to pursue a career that will bridge medical research and patient care. I am excited to explore the possibility of undertaking this career path in association with NASA. I also hope to dedicate a portion of my time to the public relations and political workings of science through published writings and leadership opportunities.

I look forward to the chance to test my mettle on a variety of challenges in the company of this year's participants. The opportunity to apply myself to new studies in astrobiology, microbial ecology, radiation biology, and other space-related fields is exciting for a scientifically-inclined mind. I also plan to apply my training in history to enhance the projects conducted by our assemblage of young scientists and engineers. My goal will be to ensure clear communication that fully contextualizes our subject matter and which is appropriately tailored to the varied interests and backgrounds of those who will read about our research. Ultimately, I hope that we can employ public outreach and other means in an attempt to improve the perceived relevance and actual impact of our work.

A couple decades on, it seems that my career path is giving me a chance to realize my childhood dreams. By participating in the Academy, I will finally get the opportunity to explore research and career opportunities at NASA. The scale of the Academy's training goals, the pace of our learning, the collaboration between students with disparate backgrounds, and the momentous scope of NASA projects make the Academy a uniquely enriching experience. In addition to gaining scientific skills, I hope to take advantage of the Academy's fiscal, public, and political policy focus to better my ability to manage scientific organizations ranging from laboratories to federal agencies. The Academy is a perfect opportunity to gain a perspective on all aspects of science and engineering in space and on Earth and is beneficial to all of the career paths – and more importantly the scientific growth – of its varied participants.



WASHINGTON UNIVERSITY
ST. LOUIS, MO

Experience and education:

Ever since I can remember, I have been in awe of the universe and its mysteries. Yet, until recently, I was unaware how to incorporate my academic interests into a field that has thus far remained a hobby. Last fall, I attended a seminar hosted by Dr. Giovanni

Fazio, Senior Physicist at the Harvard Smithsonian Center for Astrophysics, who lectured on a broad scope of space research. Intrigued by his passion and expertise I approached him with a simple, yet life-changing question: “What advice can you provide a Biomedical Engineering student, like me, who wants to pursue a career in space-related research?” Immediately noticing my passion he quickly introduced me to a professor at Washington University who has guided me along my pursuit.

This fall, I was granted the opportunity to work on NASA’s Super-TIGER (Super Trans-Iron Galactic Element Record) project. The project aims to gather information on the origins and properties of galactic cosmic rays via detection from a balloon apparatus that we are currently constructing. I am ecstatic to know that my hand can have a direct impact on the future of space research, and look forward to continuing the trend at Ames.

With my previous experience, I have finally realized how simple it is to combine both of my passions, Biomedical Engineering and Astrophysics, into one: Astrobiology. My goal for this summer is to add to my unique set of knowledge by working on one of Ames’s research projects. After graduating from Washington University in St. Louis next year, I plan on pursuing a PhD in an Astrobiology related field so that someday I can live out my dream of contributing to NASA’s groundbreaking research.

Extracurricular Activities:

Outside of the classroom and research lab, I serve as the Vice President of Washington University’s Engineers Without Borders and Engineering World Health chapters. Through these organizations, I have been able to use

BIOMEDICAL ENGINEERING

PI: RICHARD BOYLE

PROJECT: THE EFFECTS OF
RADIATION AND MICROGRAVITY
ON THE VESTIBULAR SYSTEM

EMAIL: AAWILLIAMS90@GMAIL.COM

the tools I have gained throughout my undergraduate career to improve communities around the world. This past year I started an Equipment Donation Program, which aims to create distribution channels to medical clinics and labs in less fortunate countries. Partnering with W.U.'s medical school, local hospitals donate decommissioned medical equipment to our project that undergraduate students repair alongside professional technicians before the equipment is sent to clinics in developing countries.

Aside from Engineers Without Borders-Engineering World Health, I serve on the Pi Beta Phi Leadership Nomination Committee, was recently initiated into Mortar Board National College Senior Honor Society and was elected as their new Fundraising Chair. Prior to beginning my undergraduate career, I was a competitive figure skater for 12 years. I also enjoy skiing and playing both the piano and violin.



ROSE-HULMAN INSTITUTE OF
TECHNOLOGY
TERRE HAUTE, IN

Education and Experience:

My interest in aeronautics has been growing since I was a child, but my commitment to further understand the field was solidified in the summer of 2006. I participated in a service trip in Kenya, Africa and spent several hours watching airplanes take off and land and spent several more hours flying. The sensation associated with these experiences has since been unparalleled in my life and the quest to learn more about aeronautics has, pardon the pun, taken flight.

My undergraduate education has been spent at Rose-Hulman Institute of Technology in Terre Haute, Indiana. Challenging courses and high expectations constantly push the students to improve their technical knowledge and work ethic. As a mechanical engineering major, I spend a majority of my time honing my teamwork abilities while tackling unique projects. My senior design task involves reverse engineering medicinal injection pens and recommending improved manufacturing and material choices based on economic resources. Aside from engineering, mathematics has always been a topic of interest, and I have tried to incorporate as many elective math classes into my class schedule as possible.

NASA Academy is the culmination of several years of sleepless nights spent studying and advancing my skill set. To say I am excited and fortunate for the opportunity is a gross understatement. As soon as I was introduced to the program, I was convinced that it was the perfect opportunity, but all of the stories and experiences I have researched from past Academies continue to exceed my expectations. I am thrilled to begin work with some of the brightest minds that our colleges have to offer and can't wait to see what we produce as a team.

Interests:

My passion for academics is only matched by my passion for running. I have been a member of cross country and track and field teams since seventh grade. While I may not be the most talented runner, I truly appreciate the camaraderie inherent to the

MECHANICAL ENGINEERING

PI: LARRY YOUNG

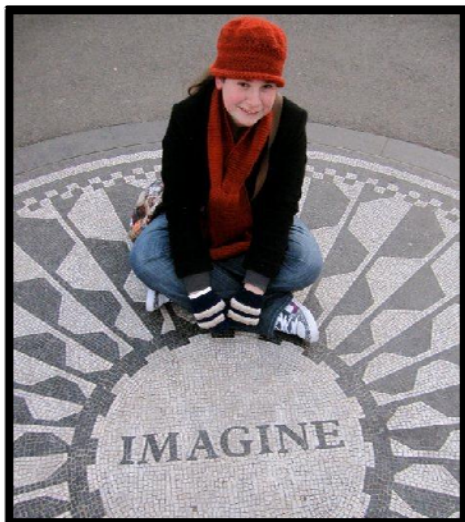
PROJECT: ROTORCRAFT STUDIES

EMAIL: MZERO@SBCGLOBAL.NET

sports. My experiences building tightly knit running teams have affected the manner in which I approach any group work. So long as a common goal exists among passionate individuals, it's easy to be surprised at the outcome of effort.

Future Plans:

While the prospect of starting my career in industry is intriguing, I can't picture myself outside of a student's role. Once I graduate from Rose-Hulman, I'd like to continue my studies in the pursuit of a Master's Degree and Ph.D. in mechanical engineering. Even if I do enter industry right away, I understand that learning is a life-long endeavor, and it will continue to shape my personality.



CHRISTOPHER NEWPORT UNIVERSITY
NEWPORT NEWS, VA

Education and experience:

My name is Angela Zoumplis and I am a senior at Christopher Newport University studying Biology and Chemistry. My research interests include a range of topics based around the

discovery of extremophiles and the characterization of the environments in which they are found.

Located only 5 hours away from commercial and non-commercial caverns, I became fascinated with caving and the possibility of finding life forms in seemingly inhabitable conditions. I have worked directly in the field of microbiology with experiments surveying the caves. The collection of samples off the beaten path in lower levels of the cavern was an amazing experience in itself during the search for cryophiles. As an undergraduate, I further explored this research area in performing experiments for the Mariners' Museum where I was given the opportunity to classify microbes found in the 'Monitor artifact' tanks.

This interest has led me to the NASA Ames Academy where I hope to learn about the evolutionary history of microbes and their future on this planet and others. After I complete my undergraduate studies, I would like to pursue a PhD in Microbiology/Astrobiology and continue research at NASA.

When I am not making new friends in petri dishes, I love outdoors activities and watching the news. I am also interested in aspects of journalism and enjoy writing and producing for political satires and current event comedy.

BIOLOGY/CHEMISTRY

PI: RACHEL MASTRAPA

PROJECT: ASTROCHEMISTRY

EMAIL: AZOUMPLIS@GMAIL.COM

2011 STAFF PROFILES



UNIVERSITY OF ARIZONA
TUCSON, AZ

Personal Philosophy:

Passionate and diverse are the two words that most prominently come to mind when attempting to describe myself. Since childhood I have always been an explorer, filled with curiosity, a thirst for knowledge, and the spirit of adventure. These characteristics have sparked an interest in science

for as long as I can remember. When I was eight years old, my family and I pioneered across the United States on a two month camping trip. One particular campground in Texas served as a host to my first awestruck gaze upon the night sky. I believe it was this moment which first inspired my fascination with space.

"We should take care not to make the intellect our god; it has, of course, powerful muscles, but no personality."

Albert Einstein (1879-1955) US (German-born) physicist

Education and Experience:

The sense of wonder embodied in that childhood camping trip has shaped most of my personal and academic pursuits. As an undergraduate at the University of Arizona in Tucson, I chose to study Optical Sciences and Engineering partially because of the appreciation which telescopes can provide for the past, present, and future of our universe. Upon graduation in May of 2011 I also obtained minors in Mechanical Engineering and Mathematics.

My research experience started in the summer of 2007 at the Optical Sensors Laboratory of the University of Maryland. As an undergraduate researcher, I fabricated and tested optical pressure and strain sensors to be applied to Army rotorcraft (a NASA funded project). The experience of working in an optical laboratory setting led to a NASA Space Grant internship with the Center for Astronomical and Adaptive Optics (CAAO). The project involved verification of mirror quality produced by

PROGRAM COORDINATOR

OPTICAL SCIENCES AND ENGINEERING

EMAIL:
KNEWMAN@EMAIL.ARIZONA.EDU

glass slumping techniques, and measurement of the efficiency of full-spectrum photovoltaic cells. My initial Space Grant project advanced into an additional semester in which I was awarded the opportunity to lead a team of student researchers.

In the spring of 2009 I embarked for a semester of study abroad in Ireland. During my tenure I researched the establishment of an image capturing system for centrifugal micro-fluids. This exciting area of biomedical optics could lead to an integrated commercial lab on a disk platform.

The following summer I participated in a DAAD Research Internship in Science and Engineering (RISE) in the small town of Siegen, Germany. I designed and constructed an infrared diode laser and an atomic beam source for the purpose of trapping ions in a miniaturized surface trap. As an introduction to research in quantum physics, this experience has helped me understand physical optics and their real world applications. Continuing my year in Europe, I joined a group of senior engineering students at the Slovak Technical University of Bratislava. We developed a computer controlled camera inspection system for automated Zebrafish larvae tracking. Upon return to Arizona, I was elected leader of the project.

The extremely rewarding study abroad experience included the opportunity to absorb several foreign cultures, learn new languages, and become familiar with research practices at European universities. During my term I traveled as much as possible and spent time with the local people, learning things about all areas of life which could be found in no textbook.

As a research associate in the 2010 NASA Ames Academy for Space Exploration, I worked on the California Allsky Meteor Surveillance (cams.seti.org) project with Dr. Peter Jenniskens at the SETI Institute. My mission was to develop an automated system of cameras to observe the night sky, tracking and recording meteors. My experience in the Academy led to several unique projects in following academic year. Again working with CAAO, I developed a camera system to track airplanes to avoid illumination from high powered lasers used in adaptive optics systems. I also designed an adaptive optics system for the Kuiper 61" Telescope, launched two high altitude balloon payloads as part of the Arizona Space Grant ASCEND program, and served as chief engineer for a two week field mission at the Mars Desert Research Station.

Goals for the Future:

In addition to coordinating the 2011 NASA Academy at Ames, I will be participating in a Zero-G flight as part of the Microgravity University program. I am returning to the University of Arizona in the Fall of 2011 to pursue a Master's Degree in Optics with the possibility of continuing formal education towards a PhD. One of my primary interests in the Academy is to pursue

research for the sake of understanding our universe. My courses in CodeV optical design programming have helped me to understand the process of telescope design and optimization, and I hope to contribute to NASA's mission of space exploration by designing space telescopes in the near future.

Extracurricular:

During the weekends, I spend most of my free time with outdoor activities. After years of hiking, fishing, rock climbing, skiing, boating, and scuba diving, I feel that I have explored some of the land and sea. My next ambition is to explore the air, so I plan to continue taking flying lessons in pursuit of a Private Pilot's License when time and funding permits. One day, I hope to explore part of space as a NASA astronaut.

UNIVERSITY OF CALIFORNIA, SAN DIEGO
LA JOLLA, CA



Veronica Wu

I have always been curious about how mechanical devices functioned, everything from watches and airplanes to a robotic arm displayed at a space museum on a field trip in the fifth grade. When I began learning about outer space in grade school, I noticed I had a keen interest in space shuttles and astronomy. I began collecting news articles on space launches and new discoveries on the moon. Reading those articles inspired me to become a scientist and to work with NASA.

I found out about the engineering field during my sophomore year of high school. After debating whether or not I wanted to major in Mechanical or Aerospace Engineering, I finally settled on Aerospace Engineering in hope of doing research on spacecraft and space exploration during and after graduate school. I am currently an undergraduate student studying Aerospace Engineering at the University of California, San Diego.

In the first three years of my undergraduate career, I have already completed part of my childhood dream of building robots and working with NASA. I participated in a Robot Design Contest in the spring quarter of my freshmen year by designing and constructing a robot built to specific operating parameters, using industry standard tools to develop skills for design and fabrication, and acquiring knowledge of and experience with Autodesk AutoCAD and Inventor and LaserCAMM. After weeks of fabrication and testing, my group successfully built a working robot with two main moving components and won the competition. Currently, I am interning at ISS EarthKAM and GRAIL MoonKAM, two NASA sponsored programs that allow middle school and

PROGRAM COORDINATOR

AEROSPACE ENGINEERING

EMAIL: VERONICAWU@COMCAST.NET

high school students the opportunity to take photos of our Earth and Moon from outer space. More specifically, I am part of the School Outreach Team at EarthKAM, which provides support and information to all participating schools during missions and year round. For the MoonKAM project, I am currently the team lead of the Orbits team, which uses orbital propagation software to determine the orbit tracks of the GRAIL satellites and the area over the Moon to ensure that the area is suitable for students to take pictures. This

internship has been instrumental in developing my time management, teamwork, and organization skills, and because the program operates on missions similar to those of NASA, I feel as though I am already working with NASA, although on a smaller scale.

As a research associate of the 2010 NASA Ames Academy for Space Exploration, I worked with Dr. Stephen Ellis on improving air traffic control through the research of panoramic displays in airport control towers of small and medium-sized airports. The project allowed me to learn more about the psychology of engineering by performing simulations with students to determine visual update rates of the human eye. It also allowed me to use prior knowledge obtained from engineering courses taken at UCSD in combination with programs used for data analysis of the update rates.

The NASA Ames Academy was definitely a rewarding and exciting experience for me, especially because it combined leadership, team building, and networking with advanced research opportunities. The summer of 2010 was undoubtedly the best summer ever! As a staff member, I hope to instill the enthusiasm I had for my Academy in the RAs of the 2011 Ames Academy.

Extracurricular Activities

Outside of schoolwork I like to play sports, watch movies, and play board games. I am also the Vice President of Theta Tau, a professional engineering organization at UCSD. Additionally, I am a member of Engineers for a Sustainable World (ESW), more specifically, the Water Purification Team of the Thailand Project. We are currently trying to design a water purification system to improve the current water filtration systems of rural Thai villages. Although I don't play the alto saxophone anymore, I love both playing and listening to music of various genres. I also love to travel; I hope to visit Australia, Japan, or France in the near future.

Future Plans

After undergraduate school, I hope to pursue Masters and Doctoral degrees in Astronautics Engineering. I am especially interested in human spaceflight and planetary rovers, but would also like to learn more about life sciences and astrophysics. I also have a strong interest in the research and resources NASA has to offer, as I aspire to have a future career at the administration.



Douglas O'Handley

Doug O'Handley is returning for the 15th year with the NASA Ames Academy. He retired from NASA after 40 years in government and academia in 1999. He is currently employed by Lockheed Martin to continue his activities with the Ames Academy. He teaches at Santa Clara University in the Physics Department.

Doug has an AB degree in astronomy from the University of Michigan and a Masters of Science and Ph.D. in Celestial Mechanics and Computer Science from Yale University.

Upon graduation from the University of Michigan, Doug was employed with the Time Service and Nautical Almanac Offices of the U.S. Naval Observatory, Washington, D.C. After graduation from Yale University, he joined NASA's Jet Propulsion Laboratory and carried out research in celestial mechanics in support of the early Mariner missions to Mercury, Venus, and Mars. He took the challenge to enter management and led research in artificial intelligence and biomedical technology.

After a brief period as staff in the Director's Office at Ames, Doug returned to southern California to work in the private sector at TRW in Redondo Beach. In 1988, he joined NASA Headquarters as the Deputy Assistant Administrator in the Office of Exploration. This was at the period of planning and the announcement of the Space Exploration Initiative by former President Bush to place humans permanently on the Moon and venture on to Mars early in the 21st century.

EMERITUS DIRECTOR FOR THE NASA
AMES ACADEMY FOR SPACE
EXPLORATION

EMAIL:
DOUGLAS.A.OHANDLEY@NASA.GOV

Returning to Ames in 1992, Doug joined the space Sciences Division in the Space Directorate.

He is a consultant with Orbitec in Madison, WI. The results of a lunar study carried out with Orbitec can be found at <http://www.niac.usra.edu/studies> under O'Handley.

Doug is a Fellow of the Royal Society of Medicine, a Fellow in the Aerospace

Medical Association, a Fellow of the American Astronautical Society, and an Associate Fellow of the American Institute of Aeronautics and Astronautics. In addition, he is a member of the International Astronomical Union and the International Academy of Astronautics, and the American Astronomical Society. He chaired, for 10 years, the Space Exploration Committee of the International Astronautical Federation.

Christy, his wife, and Doug will be spending more time in Tahoe this summer but will get to know all of you personally. You always are welcome at either of our place in Morgan Hill or Lake Tahoe. You have become part of our extended family by your selection to the Ames Academy.



Brad received his B.S. in physics with minors in optics, chemistry and Japanese from Rose-Hulman Institute of Technology. From there, he received his M.S. in astrophysics from New Mexico Tech where he used the Very Large Array (VLA) to qualitatively analyze spectra from pulsars. After working for 2 years at NASA Ames as a hardware engineer for the International Space Station, Brad went back to graduate school at Scripps Institution of Oceanography in San Diego where he got his PhD in marine microbiology and geochemistry. In addition to being the Director of the NASA Academy, he also acts as the senior scientist for the NASA Lunar Science Institute.

In 1998, Brad was accepted into the NASA Ames Astrobiology Academy where he worked with PIs Lou Allamandola and Doug Hudgins on the spectroscopic determination of polycyclic aromatic hydrocarbons in the interstellar medium. He enjoyed the Academy experience so much that he came back in 1999 to work as a staff member for the Academy.

With his varied scientific background, Brad will be a good contact and resource for students looking to break into new fields of interdisciplinary science or for graduate school advice. The academy was a life changing summer experience for Brad as he would guarantee that he would be working at an optical plant as an engineer in Albuquerque, NM without the experience and contacts that the Academy gave to him. Brad is excited to give back to the Academy in this capacity and is looking forward to meeting all of the Research Associates when they arrive in June!

NASA LUNAR SCIENCE INSTITUTE
STAFF SCIENTIST AND DEPUTY
DIRECTOR FOR THE NASA AMES
ACADEMY FOR SPACE EXPLORATION

EMAIL: BRAD.BAILEY@NASA.GOV



NASA AMES RESEARCH CENTER

Kristina Gibbs is the Deputy Program Manager for the Academy and the Lockheed Martin Manager overseeing the Academy's daily operations. In addition to this task, Kristina manages support for other NASA organizations including the NASA Astrobiology Institute and the NASA Lunar Sciences Institute. Kristina also

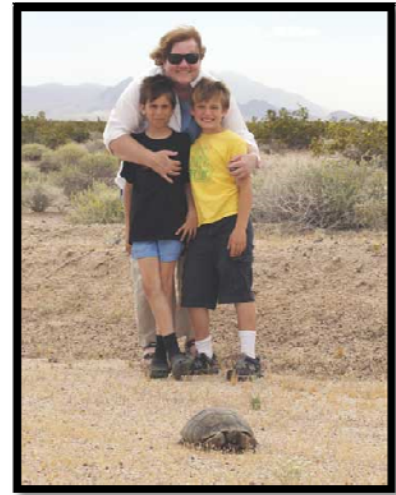
has the responsibility for strategic planning and hiring the Academy staff and drivers.

Until recently, Kristina has been working for Lockheed Martin in support of NASA Ames Life Science Payloads for over 15 years. She first started as a liaison between NASA and the Principal Investigators of the Mir /Shuttle payloads, working collaboratively with Russian Researchers. From 1999 to 2002, Kristina was the Project Scientist for two of the first life science payloads in the ISS. As the first Lockheed Martin employee to manage a NASA payload, Kristina facilitated microbiology hardware development and flight operations. Kristina has supported over 10 Mir, STS and ISS payloads and over 20 Principal Investigators . Just over a year ago Kristina was appointed as Manager to the Lockheed Martin Institutes and Collaborative Technologies section.

Kristina is looking forward to your arrival and working with you this summer.

SECTION MANAGER FOR LOCKHEED
MARTIN AND DIRECTOR FOR THE
NASA AMES ACADEMY FOR SPACE
EXPLORATION

EMAIL: KRISTINA.GIBBS@NASA.GOV



For over 25 years now, I've been making my way to NASA Ames nearly every weekday morning – with the exception of a few swing and graveyard shifts – and also vacations! I began my career designing and developing computer imagery system (CGI) applications for flight simulation at NASA Ames' Vertical Motion Simulator (<http://www.simlabs.arc.nasa.gov/vms/vms.html>). This work included development of extremely high fidelity imagery for fixed wing and rotorcraft simulation, as well as head-up and head-down displays for the Space Shuttle and military applications. I later focused on incorporating graphic visual displays into wind tunnel data representation.

Having decided to enact my not-yet-middle-age crisis on the career front, I took leave for one year to attend Stanford's Teacher Education Program (STEP) to earn a Master's in Education as well as teaching credentials in mathematics and computer science. After returning to Ames I joined the Education Division and focused on the development of teacher education workshops. However, I had been seriously bitten by the academia bug and returned to Stanford's PhD program in Curriculum and Teacher Education, focusing on science education.

My research has focused on how teachers leverage informal education experiences inside their classrooms. For my dissertation I was lucky enough to be able to work with teachers who, with their students, participated in week-long residential camps at California's Marin Headlands – part of the Golden Gate National Recreation Area and one of the components of the environmental education-based Yosemite National Institutes. While about half of my research

CODE V PROGRAM DIRECTOR FOR
THE NASA AMES ACADEMY FOR
SPACE EXPLORATION

EMAIL: LIZA.COE@NASA.GOV

time was spent doing classroom observations and interviews, I got to spend the other half hiking around the gorgeous Headlands and learning as much natural science as I could absorb. My PhD minor is in geology, so I got my fill of sub-duction zone morphology courtesy of the San Andreas Fault which has left its mark in numerous ways on the Headlands.

Prior to the arrival of my two sons I took advantage of every field experience I could talk my way into. I spent several months on a tiny little island off the Katmai coast in Alaska excavating, identifying and

cataloguing artifacts from an Indian civilization thousands of years old. Another favorite was spending a summer (their winter) in Western Australia tracing the Devonian extinction boundary in massive limestone and marble exposed reefs. Wanderlust has led me to spend many months (over time) working in and exploring the desert southwest as well as Alaska and, of course, California. If you ever need a travel guide on the West Coast, just let me know!

Now my time and energy (outside of work, of course!) is spent being mom to my two explorers-in-training. I am proud to say that they are world travelers and don't think twice about taking long plane rides to interesting places – if they can watch movies all night! They were both born in Russia and, since coming home have dragged their carry-ons with Mom to Alaska, Hawaii, Mexico, Australia and just about every place in between. In between trips they go to second grade while Mom earns the money for the next trip!

My primary responsibility is to ensure the success of the Academy which means that I lead a team of professionals who are dedicated to making the mission of the NASA Academy a reality. I work everything from the "big picture" of what NASA's goals are for the Academy, how the Academy will work (i.e. how to provide cutting-edge research experiences as well as training in leadership and team building) and the organization of experiences outside of your daily research efforts to enhance your learning. This year brings new leadership and staff to the Academy and we are very interested in your thoughts about your experiences and learning so that we can evolve the program to be even better than it is. To this end, I will be conducting evaluations of the program elements as we go through the summer - so every once in a while I will be asking you to take a step back for a few minutes from your everyday activities and reflect on what you've learned and experienced. We're all looking forward to a great Academy and a wonderful summer in Northern California!

NASA AMES RESEARCH CENTER



My history with NASA began in 1996 as an undergraduate at the University of Florida, developing means to analyze & broadcast Jovian Decametric Radio emissions at the UF Radio Observatory. Through funding from the Florida Space Grant Consortium and NASA's RadioJOVE & INSPIRE projects, I developed the first ever internet audio streaming of radio astronomy observations. As a child, I had always loved Astronomy and had dreamed of being an astronaut; so I thought, why not study space itself!

In 1997, astronaut Dr. (and USAF Col.) Cady Coleman suggested I reconsider my path given that most astronauts don't study astronomy while in space. I met Dr. Coleman at UF after a presentation on a mission aboard Space Shuttle Columbia, STS-93. One of her goals was to work on a UF professor's genetically modified *Arabidopsis thaliana* plants for the first molecular biology experiment performed in space. After waiting in line, Dr. Coleman convinced me to consider choosing a major involving plant biology. The very next day I selected Environmental Horticulture; the art and science of cultivating plants in unnatural habitats.

My interest in both astronomy & biology strained the internet's first search engines. Before Google, I still was able to discover the budding field of Astrobiology, and in turn the NASA Ames Academy. I was so intent on entering the Academy that I continued to apply after two rejections. It was not until my third try that Dr. Douglas O'Handley finally accepted my application for the 2000 NASA Ames Astrobiology Academy, affectionately known as NAABA2k. I worked with Dr. Jeffrey D. Smith on studying *Arabidopsis thaliana* morphology & starch production in hypergravity.

Immediately after the Academy, Lockheed Martin hired me to complete the project over following months.

EXPLORATION SOLUTIONS, INC.
WINTER PARK, FL

ALUMNI OF THE 2000 AMES
ACADEMY

EMAIL: MATTHEW.REYES@NASA.GOV

In 2001, I returned to UF for graduate studies of Plant Molecular & Cell Biology in the same laboratory that developed Dr. Coleman's plant space biology experiment. Under Dr. Robert J. Ferl's supervision, I studied the biochemistry of starch synthesis and the molecular evolution of protein-protein interactions.

Dr. Ferl also provided me opportunities to

work plant molecular biology experiments in microgravity 49 aboard NASA's KC-135, the "Vomit Comet". My intent was to graduate with a Master's degree and work at Kennedy Space Center, however, the 2003 Columbia disaster ended the funding, and my dreams of working in space life sciences at NASA.

In 2004 I was contacted by Loretta Hidalgo through the NASA Academy Alumni Association mailing list about a chance to work for the ZERO GRAVITY CORPORATION: the world's first publicly available microgravity flight experience. The opportunity was irresistible, and in 2004 I suspended my graduate work to eventually become ZERO-G's Director of Technical Operations. With ZERO-G I had been a participant on over 100 flights, oversaw hundreds of educator, research, and tourist passengers, and helped produced and/or appeared in nearly a dozen TV commercials & shows, including the Mythbusters and the feature documentary: "Inspire Me: Weightless Flights of Discovery".

The educational aspects of my work with ZERO-G compelled me to start my own education outreach company, Exploration Solutions, Inc. Through Explorations Solutions, I have worked as a freelancer on a wide variety of education projects of through video & social media. The highlights of my work with Exploration Solutions happened within precisely 6 months of each other, taking me to the oldest landmass on Earth to the newest volcanic rocks to rise from the ocean.

In July 2007, I worked with astronaut and ISS Expedition 10 Commander Leroy Chiao and NASAWATCH editor Keith Cowing at the Haughton Mars Project Research Station in the Canadian high Arctic. While there, Leroy, Keith & I developed webcasts for children viewing our activities at several Challenger Learning Centers across North America. In December of the same year, I worked in the Galápagos Islands, Ecuador with Rollins College and the US non-profit Galápagos ICE: Immerse, Connect Evolve. In service to Rollins college and it's students, I produced videos that highlighted their activities educating the local Galápageños skills in English, health, and the principles of environmental conservation.

Matthew Frederick Reyes is my full name, though as a result of there being multiple Matthew's in the NASA Academy program, Señor Reyes was the moniker of choice by my Academy brethren. Throughout my adult life I have also worked as a motorcycle mechanic and have ridden thousands of miles upon my pair of Suzuki cruisers. Thus my other nickname is "motorbikematt", which a quick Google search will find more details than I even remember.



Desireemol Bridges

Desireemol Bridges is the Program Coordinator for the NASA Ames Academy for Space Exploration. Desi has had a hand in coordinating all the operational needs of the 2010 and 2011 Academies. She gets things done efficiently and with minimal collateral. Desi is available to help you and the staff with any logistical issues.

Desi joined Lockheed Martin two years ago as an administrative assistant. In addition to working at NASA Ames, she is studying criminal justice and business management. Prior to working with us, Desi was employed as a funding specialist and software tester in the mortgage industry.

Desi looks forward to working with all of you.

PURCHASING SUPPORT FOR
LOCKHEED MARTIN AND PROGRAM
COORDINATOR FOR THE NASA
AMES ACADEMY FOR SPACE
EXPLORATION.

EMAIL:
DESIREEMOL.R.BRIDGES@NASA.GOV